Three Bears Lake and Dams
2,000 Feet North of Marias Pass
Glacier National Park
Village of East Park vicinity
Glacier County
Montana

HAER No. MT-88

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

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Three Bears Lake and Dams
HAER No. MT-88

Location:	Approximately 2,000 feet north of Marias Pass, Glacier National Park, Village of East Glacier Park vicinity, Glacier County, Montana UTM: Zone 12, 325000 E 535400 N Quad: Summit
Date of Construction:	1902
Present Owner:	Glacier National Park National Park Service U.S. Department of the Interior West Glacier, Montana
Present Use:	Abandoned as a water retention system in 1956. The Autumn Creek Hiking Trail crosses the West Dam. The East Dam was breached in the Fall of 1991 to alleviate a threat of failure and subsequent flooding. The facility will be interpreted with a small sign on site.
Significance:	The Three Bears Lake Dam was an earthen dam/wooden pipe water collection/distribution system that serviced steam locomotives for the Great Northern Railroad.
Historian:	Bruce Fladmark Park Ranger Cultural Resources Glacier National Park

I. HISTORY

A. Early Exploration of the Area

Much of the early history, exploration, and mapping of Northwestern Montana centers around the search for an easy-to-use route through the northern Rocky Mountains. In 1853, Governor Isaac I. Stevens of Washington Territory initiated the first railroad survey of the northern mountains. Several other survey expeditions followed, all unsuccessful at locating and recording a feasible rail route through the mountains.

Marias Pass, located on the southeastern boundary of Glacier National Park, was not explored or recorded until engineer John F. Stevens investigated the route for the Great Northern Railway in late 1889. The exploration and mapping of Marias Pass as a feasible rail route by Stevens and others was followed by an immediate decision on the part of his employer, James J. Hill, to build a Great Northern Railroad route from Minnesota through the Dakotas, across Montana, through Marias Pass to Washington State. By 1891, a route had been built through the pass and facilities appropriate to the operation of a railroad, such as water towers and depots, were being developed along the route.

One such facility was developed at Marias Pass. The depot, siding, turnabout, and water system terminus were collectively called "Summit," or "Summit Station."

B. Need for the Dams

The path of the transcontinental Great Northern Railway traversed Marias Pass in 1889, and the route was in full operation by 1892. The relatively steep grades encountered in the ascent of the pass caused the railway to establish "helper districts" on the crossing's east and west slopes. Extra locomotives were added to trains tackling the grades of these districts. Helper locomotives worked the east side of the pass from Blackfoot to Summit and on the west side from Essex to Summit. This made Summit Station one of the busier points on the Great Northern line, as it was here that helper locomotives were uncoupled from their trains and dispatched back to their respective bases.

As with most station stops during the days of steam locomotives, a constant water supply was needed at Summit Station to resupply the steam engines. In most cases, this water was supplied by wells or diverted streams, but the elevation and geography of Marias Pass made these options impractical.

The railroad developed a good water supply for Summit Depot in 1902 by diverting water from Summit Lake, some 2,000 feet north of the railroad line. This was done by constructing small earthen dams and a buried wood-stave water piping system. The dams, water system, and lake at this time began to be called "Three Bears." The early dams were modestly constructed, using horse-drawn earth scrapers.[1] The water system served a 50,000 gallon water storage tank, which was installed at Summit.

C. Location

Three Bears Dam (East) and reservoir lie approximately 2,000 feet north of Marias Pass. A similar dam, Three Bears Dam (West) lies nearby on the small reservoir. A naturally-occurring body of water at this site was first named "Summit Lake," probably due to its proximity to Summit Station, the Great Northern Railway Station located at Marias Pass. The site of the station is still called "Summit."

D. Name

The origin of the name "Three Bears" is unknown. The area is prime habitat for both Grizzly and Black bears. One could theorize that the name resulted from the sighting of three bears at the reservoir at once, during construction of the dams. Even today, this would not be particularly uncommon in the area, i.e., a mother bear and two cubs.

II. THE DAMS

A. Description

Today, the capacity of the Three Bears Reservoir is about 93 acre-feet, with a surface area of about 26 acres, and a maximum water depth of 6.5 feet.[2] The reservoir is impounded by two earthfill dams, one on each side of the Continental Divide. The east dam is 576 feet long with a crest width of 20 feet and is about 10 feet high. The west dam is 350 feet long with a crest width of 6 to 8 feet and a structural height of about 20 feet. The crest elevation of both dams is about 5,286 feet. Wooden vertical tongue and groove board piling along the upstream face of each dam provides protection from wave erosion.

The original facilities at Three Bears Lake did not include a spillway, but in the early 1970s, the National Park Service excavated an earth channel spillway through the east dam near its right abutment. This spillway had a crest about 4.0 feet lower than the crest of the east dam and had a 20-foot-wide bottom.

Due to the mandates of the Dam Safety Act and concern about the deteriorating condition of the dam, the spillway was enlarged and deepened in the fall of 1991. The spillway now bas a crest of 10 feet lower than the crest of the dam and is about 30 feet wide at the bottom and 45 feet wide at its top.

A wooden outlet works structure is still extant near the east dam. The wooden board piling on the upstream face of the east dam is badly deteriorated above the normal water level, which has resulted in erosion of the upstream face above the remaining wood piling on much of the east dam, due to wave action. The erosion most threatening to the safety of the dams of Three Bears Lake is adjacent to the left side of the spillway and opposite to the backcutting approaching from the downstream on the left side of the spillway. These two erosion actions have narrowed the crest of the embankment to less than 10 feet wide.

Most of the piling on the west dam is still relatively intact, and only a few minor areas of erosion of the upstream face due to wave action exist. This dam appears to be in better condition than the east dam, but it was actively seeping water in August 1990. There is a hiking trail across the dam.

The outlet works has been abandoned for many years. It is comprised of a wooden intake structure at the east dam and an approximately 1/2-mile-long buried wood stave pipeline to the railroad at Summit Depot. Because the outlet works intake structure is partially submerged, and because the location of the buried woodstave pipeline is not evident, the present condition of the outlet works cannot be observed. It is reasonable to assume the outlet work is badly deteriorated and in poor condition.

B. Modifications

In the late 1920s, Three Bears Lake completely froze over, during a succession of cold winters, making it impossible to divert water from the lake to the depot. The railway began to plan to enlarge the dams, and thereby deepen the reservoir. They investigated their ownership status of the water storage and delivery system, and found that an act of Congress would be needed to enlarge the lake within the boundaries of Glacier National Park, which had been established in 1910.

Fortunately for the railway, Glacier National Park Superintendent Ross Aiken agreed that no permits or other formality would be needed if the surface area of the water was not enlarged greatly.[3] With this reassurance, the railway raised the crest of the dams four feet and installed wooden cribbing to retard wave erosion of the dams in the fall of 1929.

The era of the steam-powered locomotives ended when diesel locomotives replaced the steam engines in the mid-1950s. This eliminated the need for a water system and storage facility at Summit Depot. Consequently, the 50,000 gallon tank was declared excess property, sold and removed from the site in 1956.[4]

Between 1970 and 1974, National Park Service crews removed some of the wooden piling erosion barriers above the waterline and breached the east dam in an effort to reduce the waterline of Summit Lake to a more natural level.

C. Ownership and Future

Early in the 1890s, it was rumored that copper and other minerals might abound in the area. This resulted in the Federal Government's purchase of a large area east of the Continental Divide from the Blackfeet tribe in the Treaty of 1895. The search for minerals in the area continued for several years, but none were found in quantity.

East of the Continental Divide, all of the land that was to be within Glacier National Park was under federal jurisdiction after 1895. It became a "forest preserve" and was protected by forest

rangers after 1897, but it remained open to homesteading and the establishment of mining claims until Glacier National Park was created in 1910. Summit (Three Bears) Lake lies within the former forest preserve and the present Glacier National Park boundaries, while the site of Summit Station is outside the boundaries of Glacier National Park and is presently owned by Burlington Northern Railroad.

The Three Bears dams, lake and water system are owned by the National Park Service, Glacier National Park, West Glacier, Montana. The land, water rights and mineral rights are also owned by the National Park Service.

For the future, the West Dam will continue as a part of the Autumn Creek Hiking Trail and will have an interpretive sign placed to tell of the role of the dams. No further work is planned on the breached East Dam. It will be allowed to revegetate naturally.

III. BIOGRAPHICAL MATERIAL

A. James J. Hill

James J. Hill, born on a back-country Ontario farm in 1838, came to the United States at the age of 17 and, within ten years, was a rising young businessman in the transportation and fuel business, helping to introduce the railroad and coal fuel to the Northwest. In 1878, when already a well-to-do provincial businessman approaching middle age, he plunged into his "great adventure." Hill, together with four associates, took over the hankrupt St. Paul & Pacific Railroad. By 1893, he had extended his renamed "Great Northern Railway" to Seattle. He was president of Great Northern Railway until 1912, when he relinquished that position to his son, Louis Hill.[5] Incidentally, Louis was instrumental in the development of tourist facilities and services in Glacier National Park through his leadership of the newly-formed (in 1911) Glacier Park Hotel Company.

IV. ENDNOTES

1. James T. Mather to C.O. Jenks, August 17, 1929. Great Northern Railway Historical Society Archives, Apple Valley, Minnesota

2. Campbell, Robert B., "Safety Evaluation of Existing Dams (SEED) Initial Examination Report and Downstream Hazard Classification - Three Bears Lake Dams - National Park Service - Glacier National Park, Montana." Denver: Bureau of Reclamation, 1991.

3. J. R. W. Davis to C. M. Harris, September 10, 1929. Great Northern Railway Historical Society Archives, Apple Valley, Minnesota.

4. Authority for Expenditure "Retirement and Sale of Tanks," July 11, 1956. Great Northern Railway Historical Society, Apple Valley, Minnesota.

5. For a comprehensive biography of James J. Hill, see Martin, Albro, James J. Hill and The Opening of the Northwest, New York: Oxford University Press, 1976.